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RELATIONSHIP BETWEEN PHYSICAL FITNESS, BODY COMPOSITION AND BLOOD PRESSURE IN ACTIVE AND PASSIVE STUDENTS

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ABSTRACT

The aim of this study was to investigate the relationship between physical fitness, body composition and blood pressure in active and passive students. This study was correlational research method. The subjects were Tehran University male students aged 20-27 years. A total of 100 persons were selected. The results showed a significant inverse relationship between physical fitness and body composition only in the vertical jump and BMI, a significant relationship between physical fitness and blood pressure and systolic blood pressure only in the sit-up and a significant relationship between body composition and blood pressure only between BMI and diastolic BP and a significant relationship between body composition and body fat percentage among active students. We can conclude that it is desirable to keep the students' physical fitness in desirable level to avoid problems such as high blood pressure, high BMI and high fat percentage.

Keywords: physical fitness, body composition, blood pressure

INTRODUCTION

Physical fitness is one of the factors that have attracted the full attention of the society. People are trying to improve their physical fitness by participating in activities such as jogging and slow of health sector, Rhythmical and aerobic exercises and, ultimately, quality of life, increase their productivity and longevity (Puyanfar, 1994).

Some experts believe that the masses of physical education Fitness should be considered by everybody, because with this operation will help to prevent certain diseases such as obesity, musculoskeletal disorders. As well as, specialists emphasize on elements such as cardiovascular function, body composition and flexibility in order to access health-related physical fitness (Azad, 2002). Physical fitness is defined having good physical stamina to execute daily business operations and appropriate physical activity (Amin Pur et al., 1991). This index is the most important role in improving physical health and health-related parameters by performing many of the skills and performance of sports at different levels (Bumpa, 1991). Physical fitness is one of the most important concepts in childhood and adolescence from public health perspective (Puyanfar, 1994) .The results showed those with better physical fitness than their classmates get better results on schools standardized tests (Amin Pur et al., 1991). So the physical health and fitness has major influence on students' learning implementation of health-related physical fitness of endurance and cardio - respiratory, muscular endurance, flexibility and body composition (Puyanfar, 1994). The results show that the increase in muscle strength, and flexibility has positive effects on the cardiovascular system - heart and reduce skeletal muscle damage.

Several physiological factors such as age, sex, body fat percentage, lean body mass, as well as genetic factors influence on preparedness of cardio - respiratory, muscular endurance, flexibility and agility (Stuart, 2000). Body composition and physical fitness is one of the factors affecting a significant effect on physiological responses to exercise (Roland, 2000). Physical exercise can significantly alter body composition. When we calculate the cost of energy overall energy, it costs moderate or steady state activity multiply on activity in a few minutes. The study of energy expenditure during exercise does not offer the overall picture. After the exercise was over,

metabolism remains temporarily high. This phenomenon was called at the time the loan oxygen, but now it is known as excess post-exercise oxygen consumption (EPOC) (Mortazavi and Shahraki, 2002; Castell and Wilmore, 2012). In a study conducted by the University of Houston and fitness center Kuyerdalas found people with ready obese individuals compared with unready thin ones are less risk of cardiovascular disease and shortened life span. This result is not confirmed as obesity but the emphasis is on physical fitness (EfsharakiNia, 2000).

Today, due to changes in lifestyle, physical activity in daily life have decreased and gradually led to loss of energy and forces and ultimately led to increase the incidence of certain diseases and health problems (Oghi, 2011).

Afzalpour et al (2010) compared the quality of life, body composition and physical fitness of 40 active and passive male faculty member of Birjand University. The results showed that active people had significantly better quality of life in terms of physical function, bodily pain, general health and social functioning, while there was no significant difference in physical - mental problems, health and vitality between two groups.

In addition, a significant difference was not observed between body composition and indexes of beauty and the power and flexibility of lumbar and pelvic in two groups. On the other hand, maximal oxygen uptake of active faculty members was significantly higher than passive faculty members. It seems that people with fit and healthy body composition have better and normal physical fitness and blood pressure and to achieve this question, researcher came up with standard procedures to reach required answer. Therefore appropriate to understand these capabilities among girls, the researchers decided to work on some characteristics of body composition (sitting height, chest circumference and fat percentage) and physical fitness Euro tests (Flexibility, horizontal, and in the meeting, Sargent, test jump), body mass index and the study of the relationship between these features.

The use of body composition and suitable physiological characteristics is very important and value among female athletes (Stuart, 2011). According to recent studies, the prevalence of hypertension and dyslipidemia is associated with BMI individuals (Brown et al., 2000).

In a similar study among Puerto Rico adolescents, the mean systolic and diastolic hypertension associated with obesity were statistically significant (GhariPour, 2013). Although in some studies the relationship between BMI and blood pressure have been shown before (Adair, 2004).

Aaron et al (2011) in an article titled after-school sports program, physical fitness and body composition in school children studied 80 primary school children centered fitness program after school and concluded that after school fitness program, improves body composition and cardiorespiratory fitness in schoolchildren.

Considering the importance of physical fitness and body composition and blood pressure in active and passive people it seems that the evaluation of this situation on girls is very important as part of future professionals and intellectuals.

Mechanization of life in the present age and physical inactivity, and hypertension and the importance of this issue that they will be the next generation mothers, and the lack of study simultaneously on the three factors of body composition, physical fitness and blood pressure, the researchers wanted to examine the relationship between these factors and use it to model of health and vitality of the community.

Materials and methods

This study is a descriptive and Post Facto one. The population of this study was active and passive athlete students at Tehran University, aged between 20 to 27 years old, 100 of them were voluntarily selected after initial screening from age, active and passive ones by filling out an activity questionnaire. Specific target research and its implementation were expressed for the participants. The subjects were randomly divided into two groups, active (n = 50) and inactive (n = 50). Sampling was selectively targeted. With the announcement of the public call in the university, the candidates according to entrance criteria were selected right afterwards. After the division of the groups, to participate of the subjects in the study they completed the written consent. And then they completed medical records questionnaire, standardized prepared questionnaires to exercise of PAR-Q, a questionnaire of assessing physical activity and nutritional status questionnaire. In order to obtain informed consent to participate in research subjects participated in two sessions. The first meeting was held one week before the day of the test and during the session were justified about

the amount of physical activity, the duration of the test session, how to perform tests as well as relive them.

In the second session, which was held the day before the test necessary points were reviewed at the end of the oral and written agreements to participate in the study, respectively. Physical fitness factors were as independent variables and factors of blood pressure and body composition were as dependent variables. Data were collected by performing fitness factors by EuroFit tests (Sargent Jump, flexibility, sit-up, pull-ups, long jump).

As well as anthropometric measurements include measurement of height, weight, body mass index, blood pressure and resting heart rate after a general recall, subjects appropriate subjects were selected according to inclusion criteria. They completed medical history questionnaire, Evaluation of physical activity readiness questionnaire and exercise questionnaire.

Data were analyzed by SPSS software version 16. Descriptive statistics were used to measure the central tendency and dispersion. After confirming normal distribution of data Kolmogorov-Smirnov test was used, t-test was used to evaluate the changes within and between groups. The hypothesis were tested with meaningful level of $P<0.05$.

Results

Table 1. Statistical description of variables

	Active		Passive	
	R	P	R	P
Sit up and BMI	0.234	0.114	-0.006	0.967
High bar and BMI	0.000	0.995	-0.246	0.076
Flexibility and BMI	0.095	0.524	-0.002	0.986
Sargent and BMI	-0.291	0.047	-0.267	0.053
Long jump and BMI	-0.051	0.731	-0.262	0.058
Step and BMI	0.127	0.393	-0.020	0.890

The results of the study indicated that the average BMI and the results of analytical research include:
According to Table (1), there is only inversely significant between vertical jump with a BMI among active group (R= -0.291 and P=0.047) but there was no significant among variables. So there is relationship between physical fitness and body composition of active students.
According to Table (1) there is no significant relationship between variables in passive ones. So there is no relationship between physical fitness and body composition.

Table 2. Statistical description of variables

	Active		Passive	
	R	P	R	P
sit-up and systolic blood pressure	0.302	0.039	-0.136	0.333
sit-up and diastolic blood pressure	0.134	0.370	0.040	0.755
High bar and systolic blood pressure	0.060	0.688	-0.174	0.212
High bar and diastolic blood pressure	0.148	0.321	-0.173	0.215
Flexibility and systolic blood pressure	0.079	0.598	0.050	0.725
Flexibility and diastolic blood pressure	0.085	0.570	0.068	0.626
Sargent and systolic blood pressure	0.185	0.213	-0.050	0.724
Sargent and diastolic blood pressure	-0.005	0.973	-0.041	0.771
Long jump and systolic blood pressure	0.210	0.157	0.030	0.831
Long jump and diastolic blood pressure	0.154	0.302	-0.029	0.837
Step and systolic blood pressure	-0.120	0.423	0.065	0.644
Step and diastolic blood pressure	0.038	0.799	-0.045	0.751

According to Table 2, there is a significant relationship between sit-up and systolic blood pressure among active group(R=0.302 and P=0.039). But there is no significant relationship in other variants.

Table 3. Statistical description of variables

	Active		Passive	
	R	P	R	P
BMI and systolic blood pressure	0.241	0.103	0.136	0.333
BMI and diastolic blood pressure	0.326	0.025	0.121	0.387

According to Table 3, there is a significant relationship between BMI of active group with diastolic blood pressure (R=0.326 and P=0.025). But there is no significant relationship between BMI and systolic blood pressure of active ones. According to Table there is a significant relationship between no significant correlations among passive ones.

Table 7. Statistical description of variables

	Active		Passive	
	R	P	R	P
BMI and Fat Percentage	0.997	0.000	0.997	0.000

According to Table 4, there is a significant relationship between BMI and fat of active and inactive ones (R=0.997 and P=0.00).

Conclusion

Our results showed that there is inverse relationship between physical fitness and body composition of active students in vertical jump with BMI. The results are consistent with the results of Imami et al. (2010), Afzalpour et al (2011). In a study mentioned, being the same in terms of flexibility and desirability of students' situation compared to the norm could be considered from two aspects, first, they are good on arrival, along with other factors such as cardiovascular endurance and muscle flexibility. Second the exercises related to flexibility in training program is not satisfactory in the conditions during the university and failed to take the required influence between the first and final year of students. Due to desired flexibility by the students compared to the norm seemed effective especially during exercises of slither, crawl, obstacles that were used more in the first year, but there was a need to do specific exercises for the betterment of both the flexibility of officers to prevent the physical damage. Graduate students were better than junior students in body composition. As a result, it can be stated that, in this case physical activity of students were effective and in terms of cardiovascular risk factors would be safe (Including VLDL cholesterol, the bad kind of blood sugar).

For students according to the recommendations of WHO were located in the spectrum of the two-level (acceptable, unacceptable) in waist to hip ratio, and body mass index in a continuum of four levels (weight, normal, overweight, obese) were both at normal levels (Imami et al., 2010).

The index, body fat percentage, graduate students had a favorable level than first year students. In addition, both were below the specified norm which was in an appropriate situation. According to the WHO recommendation students were in four continuum levels (thin, normal, tend to be overweight, overweight) were at normal levels (Imam et al., 2010).

So, physical activities were applied without any problem at more appropriate range and in line with US military training for students. But the survey results did not match with the findings of Arab Assadi et al (2009), Minasian et al (2012), Monique et al (2012), Buenos et al (2010), and Aron (2011), Timothy et al (2008), Mac and colleagues (2010), Toryola et al (2012), Edson et al. (2009). In a study of adolescents were reported, those who were involved in high-intensity of physical activity, were recovered their body fat and cardio respiratory fitness (CRF), although some of obese adolescents had difficulty in maintaining of high levels of vigorous physical activity. As a result, inactive lifestyle obese patients had lower fitness levels and inversely, lower fat mass was associated with higher fitness. The results showed there was a significant relationship between physical fitness and blood pressure among male students and there was no relationship between physical fitness and blood pressure.

In a study it was noted, lean body mass had a high basal metabolic rate (BMR) than fat mass, and increased lean body weight and total energy expenditure was increased even at rest. Lean body weight loss led to a decrease in metabolic rate that was followed by an important risk factor for weight gain. Recent studies have shown that resistance training could circle even with no change in blood lipid profile, blood pressure or glycemic control, leading to improved endothelial function during 8-12 weeks. This is consistent with no change in blood lipid and CRP levels before and after exercise was not observed during the 12-week period. The results showed that there was a significant relationship between diastolic blood pressure and BMI and there was no relationship between body composition and blood pressure. The results did not match with the findings of Mo'Nique et al. (2008), Su et al. (2010).

In mentioned study, the more obese the less body sensitive and in addition the daily activities were limited. This physical inactivity in turn leads to sit while working. So, it was natural to expect that an obese person has a lower level of readiness. However, most studies were limited on key parameters to assess the readiness level of VO2 max, as an indicator of cardiorespiratory resistance.

The results showed there was a significant relationship between BMI and body fat percentage. The results were consistent with the findings of Eftekhari et al (2009). Several researchers, including Gharakhanlou et al. (2002) and Bahr (2006), confirmed the relationship between body fat percentage, body mass index and waist to hip ratio with cardiac risk factors and considered body composition as a function of climatic conditions and lifestyle (Eftekhari et al., 2009). Obesity were higher among inactive group while body mass index, showed overweight among active group. In fact, the individual muscle weight could be an increase in body mass index and therefore body mass index did not have sufficient accuracy and by measuring the subcutaneous fat could reduce the likelihood of errors (Eftekhari et al., 2009). Also, by calculating the percentage of fat and the amount of fat and lean mass, we saw weight and fat percentage was significantly lower in the active group and Fat-free mass was significantly higher in active group than inactive one.

The overall conclusion from this study is that there is a significant relationship between physical fitness and body composition only in vertical jump. Thus, the much work in vertical jump, the more reduction in BMI, which can have positive and beneficial effects on individual components. On the other hand, sit and reach can lead to high blood pressure is active students and also, high BMI can also enhance diastolic blood pressure that is bad. In both active and passive students high BMI increases fat percentage. It was concluded that it is desirable to keep the students' physical fitness to prevent problems such as high blood pressure, high BMI and high fat content and it is possible through physical activity and keep yourself in optimal physical condition possible.

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